

**Patent claims**

1. A heat exchanger, in particular a flat pipe evaporator (1) for a motor vehicle air conditioning system, comprising at least one collecting tank (2) made of sheet metal, which is divided in the longitudinal direction into at least two chambers, and the ends of pipes, in particular flat pipes, are introduced in the base thereof, which collecting tank (2) exhibits a tunnel-shaped collecting tank part (5), an essentially flat collecting tank part (4), which forms the base, and covers (6) which are arranged in each case on the front side, **characterized in that** at least one cover (6) is embodied in a flat manner, at least in the area of its outer edge, and is positioned in the collecting tank with a positive fit.
2. The heat exchanger as claimed in claim 1, characterized in that the cover (6) is introduced from the front side and on the collecting tank side lies against a number of stops (10) that are formed on the tunnel-shaped part (5) of the collecting tank and/or on the flat part (4) of the collecting tank.
3. The heat exchanger as claimed in claims 1 or 2, characterized in that the cover (6) is preferably secured by means of a number of bent brackets (11).
4. The heat exchanger as claimed in claim 3, characterized in that the brackets (11) are part of the tunnel-shaped part (5) of the collecting tank and/or the flat part (4) of the collecting tank.

5. The heat exchanger as claimed in one of the foregoing claims, characterized in that the cover (6) exhibits an opening (12) for the supply or  
5 return of the cooling medium, the edge of which is bent outwards in particular.
10. The heat exchanger as claimed in claim 5, characterized in that the opening (12) is executed as a raised rim passage.
15. The heat exchanger as claimed in claims 5 or 6, characterized in that the opening (12) is of conical execution with an angle having a maximum value of 5°, and in particular from 2° to 3°.
20. The heat exchanger as claimed in one of claims 5 to 7, characterized in that a suction pipe (14), which is attached to the cover (6) with an opening (12), exhibits an internal diameter that corresponds more or less to the external diameter of the edge circumscribing the opening (12).
25. The heat exchanger as claimed in one of claims 5 to 8, characterized in that an injection pipe (13), which is attached to a cover (6) with an opening (12), exhibits an external diameter that corresponds more or less to the smallest internal diameter of the edge circumscribing the opening.  
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35. The heat exchanger as claimed in one of the foregoing claims, characterized in that the edge of the collecting tank metal sheet for the cover (6) exhibits an insertion taper.
11. The heat exchanger as claimed in one of the foregoing claims, characterized in that the two tunnel-shaped parts (5) of the collecting tank exhibit an essentially semicircular form.

12. The heat exchanger as claimed in one of the foregoing claims, characterized in that separating walls (8) in the heat exchanger are arranged in such a way that the flow through the heat exchanger is four-fold or greater.
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13. The heat exchanger in particular as claimed in one of the foregoing claims, with flat pipes and corrugated ribs, with at least one collecting tank, into the base of which the ends of the flat pipes are introduced, in conjunction with which the corrugated ribs exhibit a rib height which corresponds in each case to the distance between two flat pipes, and in conjunction with which two rib sections connected in each case via a rib arc are inclined towards each other at an opening angle  $\alpha$ , characterized in that the corrugated rib (3) exhibits a height of 3 to 6 mm, and preferably 4 to 5 mm, and a rib density of 50 to 90 ribs, and preferably 60 to 80 ribs, and in particular preferably 70 ribs per 100 mm.
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14. The heat exchanger as claimed in one of the foregoing claims, characterized in that the opening angle of at least two rib sections, and preferably a large number or all of the rib sections, amounts to  $22^\circ +/- 7^\circ$  or  $30^\circ +/- 10^\circ$ .
15. The heat exchanger as claimed in one of the foregoing claims, characterized in that one or more rib arcs exhibit, at least in some areas, a radius of curvature smaller than 0.4 mm, preferably smaller than or equal to 0.35 mm, and in particular preferably smaller than or equal to 0.3 mm.

16. The heat exchanger as claimed in one of the foregoing claims, characterized in that the flat pipes exhibit a width in the order of 1.5 to 3 mm.
- 5 17. A motor vehicle air conditioning system, characterized by an evaporator as claimed in one of the foregoing claims.